



MINISTRY OF
AGRICULTURE, FISHERIES AND FOOD

FOOD STANDARDS COMMITTEE

REPORT ON SOFT DRINKS



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FOOD STANDARDS COMMITTEE

The present terms of reference of the Food Standards Committee are :

To advise the Secretary of State for Scotland, the Minister of Agriculture, Fisheries and Food, the Minister of Health, and as respects Northern Ireland the Secretary of State for the Home Department, on the composition, description, labelling and advertising of food with particular reference to the exercise of the powers conferred on Ministers by Sections 4, 5 and 7 of the Food and Drugs Act, 1955, and the corresponding provisions in enactments relating to Scotland and Northern Ireland.

The following served on the Food Standards Committee during the preparation of this report:

NORMAN C. WRIGHT, Esq., C.B., M.A., D.Sc., Ph.D., F.R.I.C.
(*Chairman*)

G. G. BARNES, Esq., C.B.E. (*Vice-Chairman*)

C. A. ADAMS, Esq., C.B.E., B.Sc., F.R.I.C., Barrister-at-Law

N. R. BEATTIE, Esq., M.D., D.P.H.

M. COMPTON, Esq.

COLIN S. DENCE, Esq., B.A.

A. GLOVER, Esq., O.B.E., M.Sc., F.R.I.C.

A. J. HOWARD, Esq., M.A., F.R.I.C.

J. M. JOHNSTON, Esq., C.B.E., M.D., M.R.C.P.E., F.R.C.S.(Ed.), F.R.S.E.

G. W. MONIER-WILLIAMS, Esq., O.B.E., M.C., M.A., Ph.D., F.R.I.C.

Professor B. S. PLATT, C.M.G., M.Sc., M.B., Ch.B., Ph.D.

H. G. SMITH, Esq., B.Sc., Ph.D., F.R.I.C.

R. W. SUTTON, Esq., O.B.E., B.Sc., F.R.I.C., F.C.S.

G. TAYLOR, Esq., O.B.E., F.R.I.C.

R. F. TYAS, Esq.

Joint Secretaries :

M. D. M. FRANKLIN, Esq.

W. M. SHORTT, Esq., M.Sc., F.R.I.C.

FOOD STANDARDS COMMITTEE

REPORT ON SOFT DRINKS

Introduction

1. This report discusses the need for regulations governing the composition of soft drinks and contains recommendations for revision of the present regulations.

2. The allocation of scarce supplies during the war led to control of the composition of soft drinks as part of the general system of licensing and allocation under Defence Regulations. When the allocation of raw materials and other controls ended in 1953, the provisions relating to composition were embodied in the Food Standards (Soft Drinks) Order, 1953, No. 1828 (as amended by S.I. No. 1089 of 1954). The then Ministry of Food made it clear that the Order was intended as a temporary measure pending the consideration by the Food Standards Committee of the future scope and level of standards. The soft drinks industry itself put forward proposals for long-term standards in October, 1955. Since that time, the Committee has been actively engaged in reviewing the many complex issues involved. Our proposals were circulated in draft to interests concerned and this report takes account of the views expressed. A list of those consulted in this way appears in Appendix A.

3. The sales of soft drinks have increased very considerably since before the war. Expenditure on all classes of soft drinks probably amounts now to something over £100m. a year. The greater proportion of the total gallonage produced is in the form of carbonated and other ready-to-drink flavoured beverages. Control over the composition of these drinks has been limited to regulation of the amount and type of the sweetening materials used. Control over the composition of soft drinks which contain fruit juice, with or without other constituents of fruit, has been more extensive and is of relatively greater importance from the point of view of protection of the consumer. We have, therefore, directed particular attention to these drinks.

4. It will be convenient if, at this stage, some explanation is given of the various types of soft drinks containing fruit constituents. First there is the traditional type of squash made from imported fruit juice, e.g. orange, lemon, lime and grapefruit, commonly further flavoured with the addition of citrus oil; these, whether in concentrated or ready-to-drink form, we term for convenience "squashes".* One of the most important developments in the soft drinks industry in recent years, a development permitted by the provision in the current Standards Order for "drinks made from whole fresh oranges", has been the very great increase in sales, both in concentrated and ready-to-drink form, of drinks which are made by comminuting the whole fruit rather than from the juice. There are a number of different processes ranging from the complete comminution of the fruit to a method which involves little more than the squeezing of the fruit. In all the processes, some of the insoluble solids of the orange are removed by sieving. But there are substantial differences in the proportion of the original fruit which is rejected and in the ratio of juice to other constituents remaining in the drink. So far, these drinks have been manufactured in this country, but we understand that experiments have been made with the importation of the comminuted fruit

* In the existing Order the concentrated drinks are also referred to as "crushes, cordials or concentrates".

in concentrated form for dilution and preparation here. All these products we shall call for convenience "comminuted drinks". Our attention has also been drawn to drinks which appear to be mixtures of squash and comminuted drink. Finally, there are the so-called "bitter" orange and lemon drinks which have recently appeared on the market. We have been told by the industry that these drinks have a fruit juice or comminuted fruit base and contain some bitter principles, often quinine. They may be drunk straight or used for mixing with spirits. They should, in our view, be regarded as squashes or comminuted drinks (depending on whether the base is juice or comminuted fruit) for the purposes of regulation and be subject to the same requirements as regards composition and labelling.

The Case for Control

5. Our terms of reference refer to provisions to be made for "preventing danger to health, loss of nutritional value or otherwise protecting purchasers". We have taken each of these factors into account in framing our recommendations, though it can be said at once that the case for controlling the composition of soft drinks must rest principally on general grounds of consumer protection.

6. Soft drinks are not an important source of nutriment. The energy value contributed by the sugar is not large. Those which contain citrus juice may contribute some vitamin C to the diet, but the amount is usually neither great nor sufficiently stable to constitute a reliable source of this vitamin. Because of the instability, which depends upon a number of factors outside the manufacturer's control, it would not be practicable to require a minimum content of vitamin C derived from the original juice in such drinks. We do not consider therefore that a case for special statutory regulations can be made out solely on the nutritional importance of soft drinks, but for the reason indicated in paragraph 5 we have felt that nutritional considerations cannot be ignored in recommending what form control should take.

7. There are, we believe, a number of ways in which the consumer of soft drinks might, inadvertently or not, be misled in the absence of statutory controls. Firstly, the development of artificial flavours and colours has reached a stage where the consumer, without some protection, could easily be misled as to the nature of the ingredients in a soft drink. This is also true of the use of saccharin in place of sugar or other carbohydrates. The voluntary Code of Practice agreed between the soft drinks industry and the Ministry of Food which has operated since 1950 goes some way to ensure that the purchaser will be able to distinguish between drinks containing fruit or fruit juices and drinks which are only flavoured, but it only deals with this aspect and depends upon there being minimum standards for the drinks based on fruit or fruit juice.

8. Secondly, confusion can arise because of the variety of drinks available and the lack of information as to their composition. We think it is almost certainly true that people think squashes contain more juice, and comminuted drinks more fruit, than is actually the case. We also believe the purchaser is ill-informed about the comparative fruit or juice content of different types of drink. Such limited evidence as has been made available to us certainly bears out both these points; in one consumer survey, 78 people out of 150 thought there was as much or more orange than water in a ready-to-drink comminuted drink which probably contained less than 5 per cent of orange constituents, and in another survey undertaken by a different organisation, the majority of those interviewed thought that a bottle of concentrated comminuted drink contained more fruit constituents than a bottle of squash, whereas the reverse is invariably the case.

9. The confusion can be increased by the way in which the products are presented and sold. For instance, mothers may think that comminuted orange drinks are of particular nutritional value because they are delivered by the roundsman with the milk. Medical Officers of Health and paediatricians have from time to time expressed concern that these drinks are given to young children, if not as a substitute for the concentrated orange juice distributed under the Welfare Food Scheme, at any rate in the belief that they are of similar value. In view of the very marked difference in the probable vitamin C content of squashes and comminuted orange drinks on the one hand and of fresh orange juice or the welfare product on the other*, it is highly desirable that the risks of confusion should be eliminated so far as possible.

10. In our opinion, the variety of products available and the many sources of possible confusion make it unlikely that local enforcing authorities would be able adequately to protect the public relying only on the general provisions of the Food and Drugs Act. We consider, therefore, that there is a strong case for Ministers to continue to use their regulation making powers under the Act to control the description and composition of soft drinks. The large amount of money spent on soft drinks, though not in itself an argument for statutory control, reinforces the need to ensure that the purchaser is adequately protected.

Squashes and Comminuted Drinks

11. At present, ready-to-drink squashes made from citrus fruit juice are required to contain not less than 80 fluid oz. (4 pints) of fruit juice per 10 gallons and the concentrated squashes not less than $2\frac{1}{2}$ gallons of juice per 10 gallons. Concentrated squashes made from any other fruit juice must contain not less than 1 gallon of fruit juice per 10 gallons. The minimum requirements for citrus fruit juice and barley drinks are 48 fluid oz. ($2\frac{3}{4}$ pints) of juice per 10 gallons for the ready-to-drink beverage and $1\frac{1}{2}$ gallons of juice per 10 gallons for the concentrated drink. Ready-to-drink and concentrated comminuted drinks are required to be made from $5\frac{1}{2}$ lb. and $27\frac{1}{2}$ lb., respectively, of comminuted fresh oranges per 10 gallons.

12. As the comminuted drinks present most difficulty we deal with them first. The present standards are unsatisfactory in several respects. They provide an uncertain protection to the public since there is no control over the proportion of the oranges removed during processing and hence no control over the amount of fruit in the drink as sold or consumed. Secondly, it would only be possible to enforce the existing provision in respect of production in this country, and then only by continuous inspection at the manufacturing premises and not by analysis. Thirdly, the description at present laid down—"drinks made from whole fresh oranges"—is, in our view, a misleading one. Finally, no provision is made for drinks made from comminuted fruit other than oranges.

13. With regard to the first of these criticisms, reference has already been made to the variations in the proportion of the fruit which is rejected under the various methods of manufacture. Variations also result from the use of different types and qualities of fruit with the same process. From both these causes the proportion of the fruit rejected can vary widely and we understand that with some processes it amounts to 50 per cent or more. We have been informed by the soft drinks industry that retention of too high a proportion of fruit can result in a drink which is too thick to be

* A teaspoonful of Welfare Orange Juice contains at least 10 mg. of vitamin C whereas a one-third pint bottle of ready-to-drink comminuted orange drink may contain as little as 1 mg.

saleable. The fruit content of the drink as sold can, of course, be affected not only by the proportion of the fruit which is rejected, but also by the amount of fruit originally used.

14. It should be noted that the form of the present provision obscures the fact that the standard for comminuted drinks is effectively lower than the standard for citrus fruit squashes. Whereas a concentrated squash is required to contain $2\frac{1}{2}$ gallons of juice per 10 gallons of drink (i.e. 25 per cent), at present a comminuted drink made with the minimum weight of oranges prescribed would contain this amount of fruit (if for the purposes of comparison fruit constituents other than fruit juice are regarded as the equivalent of fruit juice) only if there was practically no rejection during processing, and in practice may contain as little as 8 per cent. It is clear that from the point of view of the consumer, a more satisfactory form of control for comminuted drinks would be one which relates to the fruit content of the product as it is offered to the purchaser.

15. The *second* objection to the present standards for comminuted drinks relates to the possibilities of enforcement. This can only be done by chemical analysis if the legal requirements relate to the composition of the final product. Even so, it was represented to us that there are analytical difficulties in determining the amount of fruit juice or other fruit constituents in a drink. We therefore appointed a special Working Party to examine these questions. The soft drinks industry and the Association of Public Analysts, as well as the Committee, were represented on the Working Party. The particular problems of analytical control are discussed in paragraph 59, and it is sufficient to record at this stage that the Working Party recommended that if there was to be a separate standard for comminuted drinks and one which would be enforceable by analysis, it would have to be expressed in terms of "potable fruit content" (i.e. the total fruit constituents of the drink whether derived from juice, pith or peel) rather than the weight of fruit used in its manufacture. We accept this view.

16. The *third* criticism of the existing provision relates to the description "drinks made from whole fresh oranges". The distinctive feature of this class of drink is that the manufacturing process involves direct extraction of part of the constituents from the whole fruit, as distinct from the mixing of previously expressed juice and citrus oils. But we think the expression "drinks made from whole oranges" might well imply that the drink contains the entire orange without any rejection (just as wholemeal flour is recognised as containing the whole of the products derived from the milling of wheat) and even that it has not been diluted in any way. Again, the intention of the word "fresh" in contradistinction to the product made from imported, preserved juice is clear, but it may be considered misleading in that, even if the oranges themselves have not been preserved, the drink itself will probably contain preservative. Moreover, the description "fresh" would be quite inappropriate for a product made from imported comminuted concentrate, if this product is developed.

17. Although we have used the term "comminuted drinks" in this report, we do not think it a suitable one for inclusion in statutory regulations. The most appropriate description would in our view be simply "drink" prefaced by the name of the fruit, e.g. "orange drink". The regulations would need to define the term, e.g., that it referred to drinks containing constituents of the fruit not limited to the juice, obtained by a process of comminuting whole fruit.

18. A beverage containing comminuted lemons is now on the market and it has been represented to us that provision should be made for comminuted drinks made from lemons, limes or grapefruit as well as oranges. We agree that provision should be made for drinks made from citrus fruit other than oranges.

19. Less need be said by way of introduction about squashes. The current standards (see paragraph 11) require a ready-to-drink squash made from citrus fruit juice to contain not less than 5 per cent of juice and the concentrated squash not less than 25 per cent. We have received evidence that the general level among reputable manufacturers is well above the minimum, but, as with comminuted drinks, there appears to be a wide range of products on the market from those containing little more than the minimum required to those which, we are given to understand, contain as much as 80 per cent of juice. The recommendation made to the Committee by the soft drinks industry was that the present minimum fruit juice requirement should be retained.

20. The salient features which thus emerge are :—

- (a) comminuted orange drinks conforming to the existing standards invariably contain less fruit constituents than citrus fruit squashes conforming to their existing standards;
- (b) there are wide variations both in the amount of fruit in the various comminuted drinks on the market (from about 8 per cent to about 20 per cent for the concentrated beverages) and in the amount of juice in the various brands of squash (from 25 per cent to, say, 80 per cent in those for consumption after dilution).

21. *The Appropriate Form of Control.* Bearing the above factors in mind, we are of the opinion that the most appropriate form of control for the juice content of squashes and the fruit content of comminuted drinks would be a statutory requirement that manufacturers should state on the bottle in percentage terms the amount of fruit or fruit juice which the drink contains.

22. A simple declaration of the percentage of fruit juice in a squash and fruit in a comminuted drink would have distinct advantages for the consumer. By giving him precise information about the chief constituent of the drink in terms which he would readily understand it would meet the criticism that at present the purchaser may be misled as to the nature of the article he buys. It should help to reduce considerably the confusion which exists at present (see paragraph 9). It would enable the purchaser to distinguish between different types and qualities of drinks and make an informed choice of the product which best meets his requirements. Moreover, compulsory declaration might encourage manufacturers to raise the juice content of their products and, in that event, consumers would benefit by a general improvement in compositional quality.

23. Declaration would also have advantages for manufacturers. Since the consumer would have a ready means of comparing the fruit juice content of different squashes and the fruit content of different comminuted drinks, the manufacturer producing drinks with a relatively high juice or fruit content would benefit. At the same time it would leave manufacturers free to produce a wide variety of squashes and comminuted drinks to the different levels of fruit juice or fruit content which technological or other considerations might dictate, providing only that they conformed to the minimum standards recommended in paragraphs 32 and 33.

24. We propose, therefore, that manufacturers should be required to declare on the label the fruit juice content of concentrated and ready-to-drink squashes in the form "contains x% fruit juice" or "contains not less than x% fruit juice", and the fruit content of concentrated and ready-to-drink comminuted drinks in the form "contains x% fruit" or "contains not less than x% fruit". Where a single fruit is used this should normally be designated, e.g. "contains x% orange juice" in the case of a squash or "contains x% orange" in the case of a comminuted drink. The declaration of fruit content for comminuted drinks, which would be based on the "potable fruit content" of the drink (see paragraph 15), would have to be on a percentage weight/volume basis. In the case of squashes, we recommend calculation of the percentage juice content on the more convenient volume/volume basis; the difference between the two methods of calculation is trivial. While these conditions would need to be specified in any regulations made to implement our proposal, there would be no need for the words "potable", "weight/volume" or "volume/volume" to be included in the label declaration itself; indeed, we would advise that they should not. The regulations would, however, need to prescribe not only the exact wording of the declaration but the size of type to be used and other requirements to ensure that the declaration was in a standard form on all labels and would be conspicuous and easily understood by the purchaser.

25. We have consulted the soft drinks industry about this recommendation and they are opposed to it. They argue that a palatable drink is the result of many factors, of which the fruit or juice content is only one. They dispute the inference that the fruit juice content of a squash or the fruit content of a comminuted drink is of prime importance. But while it may be true that people buy soft drinks for a variety of reasons, including simple preference for taste, our main concern is that they should have the opportunity of knowing what they are buying. If they are interested in the fruit or fruit juice content they will find a declaration informative; if they are not, they will be free to disregard it.

26. The trade also suggested that in certain circumstances a declaration of fruit or juice content might be misleading. For example, it was a matter of opinion whether a product containing more fruit juice and less sugar was superior to a product containing less fruit juice and more sugar; moreover, the figure of fruit content for a comminuted drink would, to the ordinary consumer, compare unfavourably with the figure of fruit juice content of a traditional squash, when in actual fact the comminuted drink might be superior in palatability. We are unable to agree that this criticism is sound; if the fruit content of a comminuted drink is lower than the juice content of a squash, the purchaser has a right to know. If compulsory declaration were to have an adverse effect on the sales of comminuted drinks, it could only mean that at present some purchasers are being misled. Informative declaration should help the public to recognise the different types of drink.

27. A further difficulty put to us was that, for economic reasons, labels are usually ordered in bulk, and there would be resultant waste if fresh labels had to be printed each time the juice or fruit content of a drink was changed, perhaps from season to season according to the type of oranges available. The trade also contend that, if declaration was required, it would be necessary to label many bottles which now bear no label or which have fired-on labels and that in the case of many drinks the only form of labelling which could be adopted would be on the cap or crown cork. We recognise that compulsory declaration might cause manufacturers some inconvenience and extra expense, but we do not feel that these should be allowed to outweigh the obvious benefits to be derived by the purchaser.

28. We also received evidence on the appropriate form of control from organisations representing citrus growers in Commonwealth countries. They agree with the proposed declaration requirement, although the West Indian producers feel strongly that in any event minimum standards are necessary to protect the public. They feel that, whichever method is adopted, it should be based on juice content alone. It is argued that the public will not appreciate the distinction between "fruit juice content" and "fruit content," and that, since what the public expects to get from comminuted drinks and squashes is juice and not a proportion of those constituents which are normally discarded, both types of drink should conform to a juice requirement. If this proposal were adopted, there would be little distinction between the two types of drink, and in our view this would not be helpful to the consumer. The characteristic flavour of the comminuted drink is largely due to the constituents of the fruit other than juice, and their use should, in our view, be recognised by the provision of separate requirements. We think manufacturers will ensure that the difference between juice and fruit content is appreciated by the public. In any event, a juice requirement for comminuted drinks would further increase the difficulties of analysis and hence of enforcement.

29. *Minimum Standards.* If our recommendation regarding compulsory declaration of fruit or fruit juice content is accepted, it is still for consideration whether minimum standards are also required. We consider it would be advisable to have both for the following reasons. Firstly, in our opinion a drink which does not contain a certain minimum amount of fruit or fruit juice cannot properly be regarded as a fruit squash or comminuted drink and should not be allowed to be sold as such even if the fruit or juice content is declared. Secondly, in the case of catering sales (see paragraph 58), declaration could not afford adequate protection to the consumer. Where the drink was sold to the customer in the bottle he would be able to see the declaration, but when served by the glass it would not be reasonable to require a declaration. The only practical method of protecting the consumer in these circumstances is by a minimum standard.

30. We believe that the soft drinks trade would welcome the retention of minimum standards, even if declaration is required, as a means of keeping inferior articles off the market and maintaining the reputation of the soft drinks industry. The latter is of some importance for the growing export trade in soft drinks.

31. It appears that there will have to be different standards for squashes and comminuted drinks. A standard common to both could only be based on juice content and we do not think this is desirable for the reasons advanced in paragraph 28. Such a standard would in any case require either a lowering of the present standards for squashes or a change in the composition of comminuted drinks. We do not think the former would be in the best interests of consumers or welcomed by reputable manufacturers. The latter would require alterations in the comminution process or else the addition of juice to the comminuted drink. Either would be regarded by manufacturers as detrimental to their product, though some sections of the trade dispute the evidence of the remainder that the addition of juice upsets the balance and spoils the flavour of the comminuted drink. But in any event, we do not think it would be justifiable to force a change in manufacturing practice for the sake of having a single standard.

32. If, as we suggest, the minimum standards are to be regarded only as supplementary means of control, it would seem reasonable to leave the standards for squashes at the existing levels and to fix the standards for the fruit content of comminuted orange drinks at a level which approximates to

the existing position. It has been suggested to us by the soft drinks industry that, taking into account the various processes and different types and qualities of oranges, an appropriate minimum potable fruit content for concentrated comminuted drinks would be 10 per cent or 11 per cent weight/volume. On the other hand, analyses from other sources give a potable fruit content for many samples of around 20 per cent, with only a few below 15 per cent. It appears, however, that at the lower end of the range there is one widely sold and reputable product containing on average only a little over 10 per cent of fruit because the proportion of the fruit rejected is relatively high. In view of this, we are prepared to accept the figure proposed by the trade as a minimum standard, provided our recommendation regarding compulsory declaration of fruit or fruit juice content is accepted. On this basis we recommend minimum standards of potable fruit content of 10 per cent for comminuted orange drinks for consumption after dilution and 2 per cent for those drinks for consumption without dilution. We recommend that the same minimum standards should also apply to comminuted drinks made with citrus fruit other than oranges.

33. We do not recommend any change in the present standard (see paragraph 11) for citrus fruit juice and barley drinks. The soft drinks industry have requested that provision should also be made for comminuted lemon barley drinks and suggest that the minimum standard should be lower than for comminuted lemon drinks since the inclusion of too much fruit in a blended drink would spoil the flavour. We accept this view and recommend a minimum standard of 7 per cent potable fruit content for concentrated comminuted lemon barley drinks. These drinks will of course be subject to the same compulsory declaration of fruit or fruit juice content as ordinary squashes and comminuted drinks.

Standards for Other Types of Soft Drinks

34. There is a large class of soft drinks which under the present Order is subject to control under two criteria only, sugar and saccharin. These drinks include ginger beer and other carbonated beverages, herbal beers and all the flavoured drinks like lemonade, orangeade, etc. If our recommendation for the sweetening of soft drinks (paragraph 52) is accepted, there would be no necessity for standards of composition for these classes of beverage. The exemption from the requirements of the Labelling of Food Order at present accorded to foods for which a statutory standard is prescribed would then no longer apply to these drinks, and manufacturers would be required to list all the ingredients on the label.

35. It has been suggested to us that the flavour of flavoured drinks can often be improved by the addition of small amounts of fruit juice. We see no objection to this practice provided no special claim is made for the addition.

36. The present Order contains a separate provision for soda water, in respect of the sodium bicarbonate content only. The trade wish to retain a standard for soda water and suggest that standards should be created for lithia water and potash water, which are not covered by the provisions of the present Order. They propose that potash water should be required to contain not less than 5 grains of potassium bicarbonate per pint and lithia water not less than 2 grains of lithium citrate per pint. We do not consider that these products are of sufficient importance to control by means of statutory regulations but we consider there is some value in retaining the existing requirement for soda water.

37. The trade propose that the standard for Indian and quinine tonic water should be retained but that the minimum sugar content should be increased to 4½ lb. per 10 gallons and the maximum saccharin content reduced to

57 grains. As discussed in paragraph 49 below, there appears to be a special case for allowing saccharin in tonic waters, and we recommend that the trade's proposal for revision of the standard be accepted.

38. When the present Soft Drinks Order was made, separate reference to "non-alcoholic wine" was omitted because of legal doubt as to whether the description was an admissible one. The effect was to bring such products within the category "any other description of soft drink containing fruit juice"; but to accommodate the provisions that in previous control Orders had applied to "non-alcoholic wine", special provision was made that, if a drink contained not less than $7\frac{1}{2}$ lb. of sugar per 10 gallons (compared with the minimum of 18 oz.) the limitation on saccharin would not apply. If our recommendations for the sweetening of soft drinks are accepted, the special provision regarding sugar and saccharin would be unnecessary and this type of product would be subject to control in respect of juice content only.

39. The soft drinks industry has asked for the reinstatement of "non-alcoholic wine" as a separate category. We are advised, in the light of the judgment of the Divisional Court in the case of *Kat v. Diment* (1951, 1 K.B. 34), that there is a risk that the description "non-alcoholic wine" might in appropriate circumstances be held to be a false trade description within the meaning of the Merchandise Marks Acts, 1887-1953. In the circumstances, we are unable to recommend that the description "non-alcoholic wine" should be recognised in any revised regulations.

Glucose Beverages

40. At present, any soft drink "sold under a clear and conspicuous description in writing indicating to an intending purchaser that it is a glucose beverage and which contains not less than 23 per cent weight in volume of liquid glucose or, alternatively, not less than 10 per cent weight in volume of dextrose monohydrate" is exempt from the provisions of the Standards Order. Although not defined in the Order, "dextrose monohydrate" refers to the hexose, D-dextrose, which in various connections is also described as "medicinal glucose", "purified glucose", or just "glucose" or "dextrose". "Liquid Glucose" is a syrup (containing about 80 per cent solids) obtained by hydrolysing starch. It is also known as "corn syrup", "hydrolysed starch" or "starch syrup". It contains dextrose, maltose, malto-dextrins and dextrins, the proportions of the various constituents varying with the degree of hydrolysis. The dextrose content of "liquid glucose" produced commercially ranges from about 11 per cent to 19 per cent (as determined by chromatographic method).

41. The manufacturers of glucose beverages would like to see the exemption at present made for these drinks translated into a standard for glucose beverages with the same provisions as to dextrose or "liquid glucose" content; but other sections of the industry see no need for special provision for this class of soft drink.

42. The separate provision for glucose beverages appears to derive from an earlier view that this type of drink has special properties as a source of quickly available energy. There is no evidence that, when taken by mouth, dextrose is more readily available to the body than ordinary sugar (sucrose). There is also no evidence that, when taken by mouth, the components of "liquid glucose" are better utilised than sucrose. These views have been confirmed by the Committee on Medical and Nutritional Aspects of Food Policy, whose advice on this matter we obtained. A copy of their report to this effect is attached as Appendix B. To introduce any standard based on dextrose or "liquid glucose" is likely to perpetuate

the belief that they have greater nutritional value than sucrose, and we recommend that no separate provision for glucose beverages should be made.

43. Glucose beverages are at present widely advertised as a source of energy with the inference that they provide energy in a special form that is quickly and readily available to the body. But the amount of energy likely to be obtained in this way is only a small fraction of the normal total daily energy requirement and is not significantly greater than can be obtained just as easily from other soft drinks containing sugar. If account is taken of the amounts likely to be consumed in a normal diet, no soft drink at present on the market can in our view be regarded as a sufficient source of carbohydrate to justify special claims relating to energy value. For this reason also, it would be misleading to promote the sale of glucose beverages or any other soft drink by advertisements of a medical or pseudo-medical character based on recommendations from the medical and nursing professions or testimonials from individual purchasers. We therefore recommend a prohibition on the use of any form of testimonial or nutritional claim based on properties of the carbohydrate content in the labelling and advertising of soft drinks.

44. Such a prohibition would still not be sufficient to deal with the widespread misconceptions which the public have, both as to the nature of the various sweetening constituents indifferently described as "glucose" and as to their nutritive values. The term "glucose" appears in some labels and advertisements as a synonym for "liquid glucose" and this is clearly misleading. Even "liquid glucose", though it is a term which the trade has long used for hydrolysed starch products, is not in our view a sufficiently explicit description to convey to the purchaser, who is unlikely to be familiar with the trade term, the essential difference between these products and the dextrose monohydrate powder which he knows as "glucose" from the chemist's shop. We therefore recommend that hydrolysed starch products used for sweetening should be referred to in labels and advertisements for soft drinks as "starch syrup", "corn syrup", or "hydrolysed starch", and dextrose monohydrate as "dextrose". We consider that, however strictly defined, continued use of the term "glucose" in labels and advertisements addressed to the ordinary purchaser could still be the cause of confusion.

45. Revocation of the existing provision will bring glucose beverages within the appropriate provision for the "-ade" class of drink, or for squashes or comminuted drinks if they contain fruit or fruit juice. The proposed ban on the use of saccharin would therefore apply.

Use of Artificial Sweetening

46. There is evidence that in the years between the two world wars saccharin was used fairly extensively in the sweetening of soft drinks. During and after the last war, until derationing in 1953, supplies of sugar were severely restricted; allocations were made only to licensed manufacturers and control over the sweetening of soft drinks was exercised in successive Soft Drinks Orders, which prescribed the minimum sugar content and maximum saccharin content of the different classes of soft drink. The present Order, which allows saccharin to contribute up to about 80 per cent of the total sweetening power of the drink, merely continued this method of control pending review.

47. We consider that these provisions should now be revised in the light of the responsibility placed on Ministers in Section 4 (2) of the Food and Drugs Act, 1955, "to have regard to the desirability of restricting, so far as practicable, the use of substances of no nutritional value as food, or as ingredients of food". Whatever may have been the practice before and during the war, we can see no good reason from the consumer's point of view why the practice of substituting a non-nutritious substance for sugar in soft drinks should continue. In our view, the consumer has a right to expect soft drinks to be sweetened with sugar.

48. The present legal requirements as to sugar and saccharin content of soft drinks do not, in fact, reflect current commercial practice. A number of soft drinks now being sold are already sweetened wholly with sugar and most others contain considerably less than the permissible amount of saccharin. The trade recognise that the present maximum for saccharin content is high and have proposed that it should be reduced so that, instead of contributing up to 80 per cent of the total sweetening power of the drink, saccharin would be allowed to contribute not more than a half; the minimum sugar content would be correspondingly increased. The trade's proposal would represent an improvement on the present statutory standard, but according to our information the amount of saccharin permitted would still be more than is used by some manufacturers today.

49. The soft drinks industry is opposed to a prohibition on the use of saccharin in soft drinks. One of the main objections put forward is that the consumer prefers the character of a drink sweetened with saccharin and sugar to one sweetened wholly with sugar and that saccharin has the effect of sweetening a drink without imparting the cloying effect on the palate produced by too much sugar. We were told that saccharin was particularly preferable in those soft drinks, such as tonic water and the "bitter" orange and lemon drinks, which are used for mixing with spirits and in which an excess of sugar would spoil the flavour. On the other hand, representatives of one section of the industry did not agree that the use of sugar as the sole sweetening agent resulted in a product which was too viscous for palatability or that the use of saccharin conferred any technological advantages in the preparation of soft drinks. On the evidence available, we have little doubt that acceptable and palatable squashes and comminuted drinks can be made sweetened wholly with sugar. Nor are we persuaded that the omission of saccharin from "bitter" drinks would materially affect the flavour. There appears to be more convincing evidence on the other hand that the use of some saccharin in tonic water makes it more suitable for mixing with spirits and we would see no objection to tonic waters being allowed to contain not more than 57 grains of saccharin per 10 gallons. We consider, however, that the presence of saccharin in the drink should be clearly stated on the label.

50. In terms of sweetening power, sugar is more expensive than saccharin. A prohibition on the use of saccharin would thus lead to increased costs for those manufacturers who are at present using saccharin in their soft drinks. The trade associations estimate that replacement with sugar of the soft drinks industry's current consumption of saccharin would cost anything from £2,400,000 to £3,000,000, depending mainly on the ruling price of sugar. What effect this might have on the selling price of soft drinks must be a matter of conjecture. The trade maintain that because retailers are reluctant to deal in farthings, or even halfpennies, the aggregate increase in prices might be as much as £5,000,000 or an additional 1d. per bottle of ready-to-drink and 2d. per bottle of concentrated soft drink. On the other hand,

some squashes and comminuted drinks on the market contain no saccharin and these are not proportionately more expensive. Moreover, even if the manufacturers passed on the whole of the cost increase, competition might prevent the distributors virtually doubling this, and thus increasing their own profits.

51. We have also received evidence against a prohibition on the use of saccharin from the manufacturers of saccharin, who point out that sales to the soft drinks industry at present account for two-thirds of all sales of saccharin in this country. Consideration of the possible consequences of removing this market goes beyond our terms of reference.

52. Having considered the objections put forward, we remain of the opinion that it would be more consistent with the general intention of the Food and Drugs Act, and of Section 4 (2) of the Aot in particular, if soft drinks were now required to be sweetened entirely with sugar or other carbohydrate sweetening matter. Our recommendation therefore is that the use of saccharin and other artificial sweeteners in soft drinks (other than tonic water and diabetic soft drinks specifically labelled as in the present Order) should be prohibited. If however Ministers feel that this recommendation cannot be accepted, then we would consider it essential, in the interests of the consumer, to limit drastically the proportion of saccharin which may be used and, further, to make special provision for the presence of saccharin to be conspicuously declared on labels.

53. If our recommendation for the prohibition of saccharin in soft drinks is accepted, then we consider that a provision stipulating a minimum sugar content would no longer be necessary. Manufacturers would be obliged to use sufficient sugar to satisfy the requirements of the public as to sweetness, and this would ensure that the sugar content was maintained at a satisfactory level. Furthermore, although the present Order refers specifically to sugar, we see no reason why manufacturers should not be free to use whatever forms of carbohydrate sweetening matter they think best.

Other Aspects of the Regulations

54. *Definition of Soft Drinks.* The present Standards Order contains a definition of soft drinks which, in the main, we accept. We suggest, however, that the present provision excluding certain fruit juices from the definition of "soft drinks" should be further amended. In our opinion, fruit juices are a separate class of product from soft drinks and, without prejudice to any further consideration which may be given to the control of their composition and labelling, we recommend that all "fruit juices, whether sweetened or unsweetened" should be excluded from the scope of the Order. The soft drinks industry represented to us that preparations of milk and coffee, cocoa, chocolate, etc., when sold as sweetened soft drinks, should be brought within the scope of the Order, but we consider that this would have the effect of unnecessarily extending its scope. The use of the word "concentrate" in the Schedule to the Order to describe certain kinds of drinks for consumption after dilution could be misleading, and we suggest that it should be omitted from any future Standards Order.

55. *Acids.* The present Standards Order does not deal with acids used to flavour soft drinks and the use of certain of them has been questioned by some authorities. Furthermore, our attention has been drawn to evidence that the consumption of acid foods and drinks may cause damage to the dental structure if the pH at the tooth surface falls below 3.5. The pH of many soft drinks at present on sale is, in fact, below this figure. The Committee on Medical and Nutritional Aspects of Food Policy, whom we consulted on this question, advised however that the risk of damage is likely to be greater

with products which remain for an appreciable time in contact with the teeth than with beverages. No objection is therefore taken on this account to the use of suitable acids in soft drinks in moderation.

56. The industry suggested that the following permissive provision should be included in the regulations: "soft drinks may contain citric, tartaric or other organic or inorganic acids in common use in the food industries". We understand that the acids used by the soft drinks industry are citric, tartaric, malic, phosphoric, lactic and acetic. Citric acid, a natural constituent of citrus fruits, is widely used for acidifying purposes; tartaric acid is commonly used as a substitute when citric acid is scarce. Malic acid and phosphoric acid are used by some manufacturers for flavouring purposes. Lactic acid and acetic acid are only used in special types of soft drink, glucose beverages in the one case and raspberry vinegar and sometimes ginger beer in the other. We see no objection to the use of these acids, but consider that additions to squashes and comminuted drinks should be restricted to those acids which are found in appreciable quantity in the free state in raw fruit, viz., citric, malic or tartaric acid. Phosphoric acid, though we understand it has been used by one or two manufacturers, does not come into this category. We therefore recommend that the regulations should permit the addition for acidifying and flavouring purposes of citric, tartaric, and malic acids to fruit drinks and the addition of these plus lactic, acetic and phosphoric acids to other soft drinks.

57. In addition, the industry considers that it should be free to add ascorbic or nicotinic acid to soft drinks, not for acidifying or flavouring purposes but as a means of increasing the nutritional value of soft drinks. We do not consider that soft drinks are an appropriate vehicle for vitamin fortification, but we would see no objection to the addition of ascorbic acid to squashes and comminuted drinks so as to give the drink when sold a vitamin content comparable to the amount originally present naturally in the relevant ingredients. Any claim based on such addition, however, should be framed in accordance with the Code of Practice on Vitamin Claims. Since nicotinic acid is not naturally present in citrus fruit, except in trace amounts, we see no need to make provision for the addition of nicotinic acid to soft drinks.

58. *Catering Sales.* At present, the standards apply to sales to a caterer in containers containing not more than one gallon of soft drink, but not to other sales to a caterer, nor to sales by a caterer for consumption on the premises of his catering business or any sale by him if he provides catering services for the consumer of the soft drinks. Our general opinion is that, so far as possible, the purchaser of a food for consumption at a catering establishment should be given the same protection as a purchaser in a retail shop. Soft drinks are widely sold in catering establishments of all kinds and the total volume of sales must be considerable. We therefore consider that the proposed minimum standards and the proposed prohibition on the use of saccharin should apply to any sale by a caterer as part of his catering business as well as to sales by retail. With regard to the proposed compulsory declaration of juice or fruit content, we have already indicated (paragraph 29) that we do not consider it practicable to apply it to all catering sales, but we do consider that it should apply to the sale by a caterer of soft drinks pre-packed in bottles or other containers, whether or not the container has been opened at the time of sale.

Enforcement

59. The determination of the juice or fruit constituent of fruit drinks presents considerable difficulties for the analyst. The special Working Party, to which reference is made in paragraph 15, examined the available evidence and recommended certain numerical factors by which estimates can be made.

This information has been passed on to public analysts. The Working Party also advised that, in all but the most exceptional circumstances, it should be possible for the analyst to differentiate between squashes and comminuted drinks. A further recommendation of the Working Party was that a standing panel of manufacturers and public analysts should be set up to obtain additional data and keep the procedure for determination of juice and fruit content under review, and this has been arranged through the co-operation of the Association of Public Analysts and the soft drinks industry. No particular problem of enforcement arises with regard to our other recommendations.

Summary of Conclusions and Recommendations

60. There is a strong case for continued regulations to control the description and composition of soft drinks (paragraphs 5-10).
61. The most appropriate form of control for soft drinks based on fruit juice, with or without other fruit constituents, is a statutory requirement to state in percentage terms the amount of fruit or fruit juice which the drink contains (paragraphs 21-28). But minimum standards of fruit or juice content are also required to ensure that the amount present justifies the description and to control the composition of such drinks sold by the glass (paragraphs 29-33). The present standard for comminuted drinks is unsatisfactory and should be replaced by one based on the potable fruit content of the drink and covering the use of other citrus fruit as well as oranges (paragraphs 12-18).
62. The description "drinks made from whole fresh oranges" may be misleading, and soft drinks made with comminuted fruit should be sold as "orange drink", "lemon drink", etc., according to the fruit used (paragraphs 16 and 17).
63. Soft drinks should be sweetened wholly with sugar or other carbohydrate sweetening matter. The use of saccharin or other non-nutritious sweetening substances (except in drinks sold expressly for diabetics and, in limited quantity, in tonic waters) is inappropriate (paragraphs 46-53).
64. Apart from the prohibition on artificial sweetening, there is no need for statutory standards of composition for carbonated and flavoured beverages, though the present standards for soda and tonic waters might be retained. The ingredients of soft drinks not subject to standards should be declared in accordance with the Labelling of Food Order (paragraphs 34-39).
65. The continuation of a separate provision for "glucose beverages" is likely to perpetuate the mistaken belief that dextrose and "liquid glucose" have greater nutritional value than sucrose. Whatever form of carbohydrate sweetening is used in soft drinks, it will not contribute more than a fraction of a normal person's energy requirement; close control of nutritional claims and the use of testimonials in the labelling and advertising of soft drinks is therefore called for (paragraphs 40-45).
66. The acids suitable for use in soft drinks should be specified (paragraphs 55-57).
67. Soft drinks sold by caterers should, so far as possible, comply with the requirements for drinks sold in retail shops (paragraph 58).
68. We therefore recommend that the Food Standards (Soft Drinks) Order, 1953, should be replaced by regulations to give effect to the above conclusions and in particular:—
 - (a) to provide that all soft drinks containing fruit juice, with or without other constituents of fruit (including "bitter orange" etc., but excluding flavoured beverages referred to in paragraph 35) should bear on

the label a declaration in prescribed form of the percentage fruit or juice content of the drink ;

(b) to provide the following minimum standards of composition :

Soft Drinks	Ingredient to be controlled	Standard for drink for consumption without dilution	Standard for drink for consumption after dilution
1. Citrus squashes ...	Fruit juice (per cent vol./vol.) ...	5	25
2. Citrus fruit drinks ...	Potable fruit content (percent wt./vol.)	2	10
3. Citrus juice and barley drinks	Fruit juice (per cent vol./vol.) ...	3	15
4. Citrus fruit and barley drinks	Potable fruit content (percent wt./vol.)	—	7
5. Lime juice and soda...	Lime juice (per cent vol./vol.) ...	3	—
6. Non-citrus fruit squashes	Fruit juice (per cent vol./vol.) ...	—	10
7. Indian or quinine tonic water	(a) Quinine (parts per million calculated as quinine sulphate B.P.)	57	—
	(b) Added sugar (per cent wt./vol.)	4½	—
	(c) Saccharin (parts per million) ...	80	—
		(maximum)	
8. Soda water ...	Sodium bicarbonate (parts per million)	570	—

- (c) to provide that the above soft drinks (but no others) should be exempt from the requirements of the Labelling of Food Order as respects declaration of ingredients ;
- (d) to prohibit the use of saccharin or other artificial sweetening agent in soft drinks other than diabetic soft drinks and tonic water appropriately labelled ;
- (e) to prohibit the use in the labelling and advertising of soft drinks of any form of testimonial or nutritional claim based on the carbohydrate content ; and to prohibit the use of the term " glucose " in the labelling and advertising of soft drinks ;
- (f) to restrict the acids used for acidifying and flavouring purposes in drinks containing fruit juice, with or without other constituents of fruit, to citric, tartaric and malic acids, and in other soft drinks to those acids with the addition of lactic, acetic and phosphoric acids ; and to allow the addition of ascorbic acid to drinks containing fruit juice, with or without other constituents of fruit, to restore the natural vitamin content of the relevant fruit ingredient ;
- (g) to apply the appropriate minimum standards to all sales of soft drinks by a caterer, and the compulsory declaration of fruit or juice content to sales by a caterer of soft drinks pre-packed in bottles or other containers ;
- (h) to define " soft drinks " and the scope of the regulations as in the present Order except as respects fruit juices, glucose beverages, catering sales and other consequential amendments.

APPENDIX A

Organisations consulted in the preparation of the report:—

Association of County Councils of Scotland
Association of Health Committees of Northern Ireland
Association of Municipal Corporations
Association of Public Analysts
Association of Public Analysts of Scotland
Association of Sea and Air Port Health Authorities
Convention of Royal Burghs
Counties of Cities Association
County Councils Association
Institute of Weights and Measures Administration
Metropolitan Boroughs' Standing Joint Committee
Rural District Councils Association
Society of Medical Officers of Health
Society of Medical Officers of Health (Scottish Branch)
Urban District Councils Association
Belfast and Ulster Mineral Water Manufacturers' Association
British Glucose Manufacturers' Association
British Hotels and Restaurants Association
British Paediatric Association
British Saccharin Sales Company Limited
Caterers' Association of Great Britain
Citrus Fruit Juice Importers' Association
Commonwealth Fruits Council
Flavouring Compound Manufacturers' Association
Food Manufacturers' Federation (Soft Drinks Section)
Industrial Catering Association
National Association of Soft Drinks Manufacturers Limited
National Caterers' Federation
Parliamentary Committee of the Co-operative Union
Scottish Federation of Aerated Water Manufacturers' and Bottlers' Association
Trade Commissioner for the British West Indies, British Guiana and British Honduras

APPENDIX B

Sucrose, Glucose and "Liquid Glucose" as Sources of Energy

Note by the Committee on Medical and Nutritional Aspects of Food Policy

1. The sugar circulating in the blood is entirely, or almost entirely, glucose; and glucose, but not sucrose, administered intravenously can be of great benefit in patients suffering from a variety of conditions. It is a fallacy, however, to infer from these facts that glucose is a more desirable source of energy than sucrose when taken by mouth.
2. There is no significant difference in the total amount of energy contributed by similar quantities of sucrose, glucose or the products of the acid hydrolysis of starch known as "liquid glucose" when given by mouth. Sucrose may even contribute a larger amount (perhaps 5 per cent more) than glucose given in this way, certainly not less.
3. The issue therefore is whether the energy of glucose, or of the components of "liquid glucose", is made available to the body more rapidly than that of sucrose when these sugars are given in solution by mouth.
4. No evidence exists that this is so; indeed the evidence, (1), (2), (3), (4), suggests the reverse, namely that sucrose can be metabolised a little more rapidly than can glucose when taken by mouth. Sucrose absorbed from the intestine can be hydrolysed in the intestinal tissue (5). This tissue hydrolysis may form substances other than simple sugars which are more active in entry to metabolic cycles than are sugars themselves (6).

5. The only human condition in which glucose given by mouth might have some advantage over sucrose is in the newborn infant, but even in this instance the data are by no means conclusive, (7), (8).
6. Fructose, which can be formed from sucrose by hydrolysis, is, unlike glucose, rapidly utilised in the body in a manner that is not dependent on the availability of insulin (9). There is little doubt that fructose is formed from sucrose ingested by mouth and the evidence at present available (9) suggests that fructose has an advantage over glucose in ease of utilisation by the body when there is a deficiency of insulin or a tendency towards such a deficiency.
7. "Liquid glucose" may contain, in addition to glucose, not only maltose, maltodextrins, and dextrans, but also brachiose and oligosaccharides based on brachiose. There is a lack of knowledge of the metabolic utilisation of these substances when taken by mouth and there is no evidence that these components of "liquid glucose" are more rapidly utilised than sucrose when taken in the form of sugar-containing drinks.
8. It is to be doubted whether there is any advantage in presenting to the human being a drink which contains a sugar which is a little more rapidly metabolised than others, but, if such a sugar were deemed to be of value, the balance of evidence suggests that sucrose might be chosen rather than glucose or the products of the partial hydrolysis of starch which are found in commercial "liquid glucose".

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